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LOW PRESSURE WIND TUNNEL  
College Avenue Tunnel

August 6, 1972

NO. 1985  
COPY

Director  
Office of Naval Research  
Bureau Office  
1000 Geary Street  
San Francisco 9, California

MONTHLY STATUS REPORT - JULY 1972

Contract N-601-295-Task 3  
Project Number N-601-003

Dear Sir:

Progress on the contract for the month of July has been as follows:

1. Minor modifications of the molecular beam instrumentation has permitted a reduction of a strong signal with reduced background noise level. Following these modifications a reflected molecular beam was scanned over a range of incident and reflected angles. The received signal indicates diffuse reflection as anticipated, the reflecting surface being a glass plate. Further reflection tests will be made following a short delay due to vacation schedules.
2. Modifications of the semiajustable diffuser have been completed. This program is awaiting final time to permit final evaluation tests.
3. The report describing the design and evaluation of the No. 8 nozzle ( $K = 4.0$  ideal) has been prepared and edited. The report will be forwarded shortly.
4. During the month of July the No. 3 Wind Tunnel has been used for a series of tests to determine the base pressure of cone-cylinder models in supersonic low density flow. This investigation will be continued during August.
5. The following report was issued in July:  
**No. 150-100: "Drag on a Rotating Cylinder at Low Pressures"** by Shih-Fei Shiang.

**Abstract:** A theoretical expression of drag coefficient is derived by the 13-moment method and compared with the equations of drag coefficient developed (Willikan and Schubberg). An experimental investigation over a Mach range from 0.14 to 0.55 ( $0.0119 < M/\sqrt{R} < 2.61$ ) shows that the rotor aerodynamic drag is proportional to the speed of rotation and that the reduction of drag at low pressures is independent of Mach number. The critical Reynolds number was determined experimentally and found to be

approximately 7% higher than the theoretical predicted value.  
No effect of compressibility or slip on the critical Reynolds number has been observed.

**6. Visitors:** The following persons visited the project during the month:

Dr. E. Eckert  
Dr. T.N. Fricke

G. W. Evans  
G. W. Patterson  
Dr. G. K. Merikawa  
Maj. Claude Wilson  
Maj. D.A. Eland  
J. M. Kendall

Dr. Morton Alperin  
Dr. Wallace Hayes  
Maj. John C. Baker  
Capt. John H. Smith  
Capt. George Yale  
Glen Goodwin  
John Linnell  
Capt. F. J. Ross

N. S. Higgins  
G. S. Polders  
Erich E. Seehagen

- Wright Field, Flight Research Lab.
- Applied Phys. Lab., Johns Hopkins Univ., Silver Spring, Maryland.
- Argonne Lab., Chicago, Ill.
- Institute of Aerophysics, Univ. of Toronto.
- ONR, Washington, D. C.
- AEDC, Tullahoma, Tenn.
- AEDC, Tullahoma, Tenn.
- Naval Ordnance Lab., White Oak, Silver Spring, Maryland.
- Western Reg. Office, OSR, Pasadena, Calif.
- OMR, London, England
- OSR, Baltimore, Maryland
- OSR, Baltimore, Maryland
- OSR, Pasadena, Calif.
- NACA, Moffett Field, Calif.
- NACA, Moffett Field, Calif.
- Flight Research Lab., Wright Air Development Command.
- Trinity College, Cambridge, England
- M.I.T., Cambridge, Mass.
- Wright Field, Dayton, Ohio

Very truly yours,

*S. A. Schaaf*

S. A. Schaaf,  
Faculty Investigator

SAS/bp

cc - OMR S.F. (1), OMR WASH. (3)

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